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Is Mathematics Education Taking a Step Backward?

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Is Mathematics Education Taking a Step Backward?

It is time to step back and reflect on the multitude of political legislation that has taken place in recent years, how the change in state leadership will affect those actions, and the educational and economic implications they will have on innocent powerless children. For example, classroom size reduction, affirmative action, bilingual education, vouchers, charter schools, teacher/principal accountability, no social promotion, elimination of "remedial" classes in the Cal State University system, and the shift back to phonics in reading and basic skills in mathematics are just a few that must be brought to the forefront. All of the aforementioned interact with one another to further undermine the success of the most disadvantaged urban youth and create structural conditions of social injustice and economic inequality.

While the hegemonic leadership claims to make decisions in the best interest of our children, it is easy to recognize that those decisions often work in concert with the political economy to maintain existing relations of domination and exploitation. Take the class size reduction initiative as a case in point. Despite its altruistic intentions, the rationale behind its implementation is less than effective. The most lucrative districts attract and hire the most qualified in a decreasing pool of candidates, and the least qualified are left to be hired by less attractive highly populated districts, namely high poverty inner city schools. All who are hired without certification are required to enroll in an accredited credential program and complete a minimum number of units a year which then permits them to renew their emergency status and continue teaching in the

classroom. Some who are hired do not even hold the minimum GPA required for acceptance into a public program. These teachers who have GPAs below 2.5 must seek a program in a private institution that will accept them or leave their assignment after a year. What are the consequences of such a practice on children in grades K-2 who are in the critical stage of building their educational foundations of language, reading, and mathematics? This is just one example of inequitable educational opportunities that have long-term effects for children who are already disenfranchised economically, linguistically and politically?

This paper focuses on the new political policy that proposes to drive mathematics education forward, but in fact will result in a giant step backward for disenfranchised groups. A brief look at the history of mathematics education and its apparent recursive nature is critical to understanding the current political debates on what mathematics should be taught, what knowing mathematics means, how it should be taught, and who is capable of achieving in mathematics.

The American educational system is historically grounded in a philosophical framework that allowed those in powerful positions to mold and define the mathematics knowledge they deemed important to know, what it means to know, who would be privileged to know it, and in what pedagogical form (Martin, 1997). Elite white males were the ones privileged to learn and profit from an education. Gradually women and people of color were allowed to attend school, but the content and pedagogy was still Anglo male driven. The pendulum has swung back and forth from a classical curriculum taught in a traditional behaviorist pedagogy to a reform

contextualized curriculum taught in a constructivist pedagogy throughout history. Even with the shifts in philosophy, the predominant practiced pedagogy has been the "traditional" (Stigler & Hiebert, 1998). The closest we have come to reversing that practice has been the movement of the past 15 years. It has probably gained the most momentum because mathematics educators have redefined what mathematics is important to know and what it means to know it so that it makes sense to a much broader audience. By doing so, all children will have the opportunity to succeed in mathematics, not just an elite few. And just as the most recent reform movement was about to gain momentum and support from all constituencies, a shift back to the traditional is again alive.

Drafts of the new Mathematics Framework for California Public Schools and Standards documents have been adopted and are ready for printing. Previously, California looked to the national Standards document for direction. Unfortunately, while the national document espoused a commendable position, it was difficult for teachers at each grade level to delineate the specific expectations they were accountable for. The National Standards Committee, realizing this weakness, began work to clarify expectations. The new revised Principles and Standards for School Mathematics document has been embraced by all the states in the nation and their state documents have been designed to support it, with California being the only exception. Instead, the state of California began its own work to create a state Standards document that claims to espouse a balance of conceptual understanding and skills, but in fact is clearly more skill-based. The document specifies by grade level what mathematics children should

know. Unfortunately, much of what is expected is not developmentally appropriate and reads like a check-off list of skills.

The process in which California's new mathematics Framework was conceived was discernibly politically motivated. The appointed committee was reconfigured with members who held viewpoints that matched political agendas and certainly not grounded in how children best learn mathematics. Instead, they made decisions based on what worked for them and what was considered important in years past; not taking into consideration the demographic and economic changes that have occurred in California. Concensus was never reached by the appointed committee, but the working document was sent forward without public review or notification to all group members of the process (Jacob, 1999).

Originally the mathematics Framework document was to be revised; instead, it has been rewritten. Many inconsistent messages seem to be indicated (e.g., a variety of approaches should be used, but the best one is the traditional teacher explain/student practice). These inconsistencies will most likely permit teachers to choose what is familiar to them - the meaningless "traditional" content and pedagogy because they have not personally experienced any other approach. Many truly believe this is the way mathematics should be taught because this is all they know. While the mathematics education literature (Prawat et al., 1992; Sowell, 1989; Ginsburg & Baron, 1993; Cobb et al., 1991; Hope & Owens, 1987) cites the importance of having children construct knowledge from the concrete through the representational and finally to the abstract stage of understanding, there is minimal mention, at most, of the benefits of using

concrete models to help children build mathematical understanding. Instead, the flawed Dixon report which is the research base for the new Framework purports to be a review of mathematics education, but in fact is an example of research biased to support the back-to-basics agenda (Jacob, 1999).

Research (Kloosterman, 1991; Kamii & Dominick, 1998) clearly documents that reverting back to having children memorize facts and algorithms will not empower children in building a firm foundation of mathematical understanding that is critical for those who remain in the mathematics pipeline and eventually are able to capitalize on the benefits of so doing in the marketplace. In addition, children who find no value or understanding in what they are doing are the ones who will drop out of the mathematics pipeline by choice or force and end up being the victims of such an unjust system.

Powerful committee members outside the realm of mathematics education, for the most part, were able to literally write new documents in which children will be judged as succeeding or not succeeding in mathematics based on historical Anglo-Saxon standards. Never mind that the demographics in California has changed so drastically in the past 15 years that Anglos make up a minority of the population in southern California. Never mind that children do not learn by memorizing, practicing, and regurgitating meaningless rules. Ask any student who has experienced a "traditional" educational experience what it means to divide a fraction by a fraction, when it is useful or why "inverting and multiplying" works and a majority will have no clue. This even applies to mathematics majors! Should it be surprising that most

students cram and memorize for a test and have no idea in two weeks how to do those same problems? Should it be surprising that prospective elementary teachers have weak mathematical understandings? By allowing only those students who live and persist in a "traditional" environment to succeed, then those who live and learn outside of that norm will surely not succeed and those lucrative positions that reward success in mathematics will not be accessible to the majority who just happen to be people of color.

Furthermore, textbook adoption panels are reviewing materials for adoption, but what is being evaluated is the accuracy of the mathematics content, whether specific skills listed in the Standards document are addressed, whether the organizational aspects of the presentation are easy for teachers to follow and understand, and whether equitable access is given to all students. While these criteria appear noble, the process will simply become a check off list, since pedagogy issues are noticeably minimalized. Instead, districts will be allowed to choose from texts that meet the above criteria. It is not surprising that accepted texts can look very different and still meet the criteria. Who will be making the decisions at the district level? Guess which texts are easiest for teachers to follow? Which students will be negatively affected by this traditional "back to basic skills" movement?

Critical educators must produce compelling evidence that the implications of the direction that mathematics education is moving in California is far greater than simply succeeding or not succeeding in mathematics; it affects the debilitating economic cycle that perpetuates a classist society. The disenfranchised will continue to blame

themselves for their failure and will have fewer career choices because of their limitations in mathematics. The "haves" will continue to "have" and the "have nots" will continue to struggle in an inequitable classist society. Perhaps the political decisions are being made consciously or subconsciously precisely to keep the large numbers of people of color in a non-threatening place. Certainly their voices were becoming heard a bit too loudly for the comfort level of the dominant group.

Those who truly believe that all students deserve an equitable opportunity to succeed in mathematics must not allow this movement to discourage or silence them. Passionate dialogue, networking, and critical mathematics education must continue so those teaching mathematics at all levels understand why so many students remain disenfranchised from a discipline that has the possibility of offering hope and opportunities for improving the quality of their lives.

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Abstract

This article addresses the current political, socioeconomic, and educational state of mathematics education in California. The "back-to-basics" movement in mathematics mirrors the "back-to-phonics" movement in language arts. At a time when ethnic minorities have become the majority, the dominant culture has chosen to revert back to practices that are inequitable and empower the elite. Critical educators must carry on the dialogue necessary to empower the disenfranchised mathematically and undermine the social injustice and economic inequality that will result if this movement is embraced.